



RECEIVED
JUL 23 2003
TC 1700

PATENT
Attorney Docket No. 168567

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

CONNORS et al.

Art Unit: 1723

Application No. 09/091,508

Examiner: K. Menon

Filed: October 30, 1998

For: **SEPARATION ARRANGEMENT**

APPELLANTS' APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In support of the appeal from the final rejection dated June 26, 2003, Appellants now submit their Brief.

Real Party In Interest

The patent application that is the subject of this appeal is assigned to Pall Corporation.

Related Appeals and Interferences

There are no appeals or interferences that are related to this appeal.

Status of Claims

As filed, the application contained claims 1-13. During subsequent prosecution, claims 5-13 were cancelled and claims 14-27 were added. During further prosecution, claims 2-4 and 20-27 were cancelled, so that claims 1 and 14-19 are pending. No claim is allowed and all of the claims on appeal appear in the Appendix.

Status of Amendments

All of the claim amendments were entered.

Summary of Invention

As described in the application, in certain purification applications, for example, high fluid flow applications, filter assemblies comprising a single housing and multiple smaller diameter, shorter length pleated filter elements are utilized. However, a large number of smaller diameter, shorter length elements increase maintenance expenses, e.g., the cost of filter elements, and system downtime, e.g., the time to change the filter elements.

According to the present invention, a separation element for separating one or more components from a fluid flowing through the separation element comprises two or more hollow pleated pack sections and open joiner caps attached to at least one end of each of the two or more pack sections. Adjacent joiner caps are secured to coaxially connect the pack sections and open joiner caps into a hollow separation arrangement being at least about 40 inches in length and having an interior diameter of at least about 2 inches. First and second end caps are attached to the hollow separation arrangement.

Each pack section has a plurality of pleats, a retainer disposed around the pleats, first and second ends, and a porous medium comprising a polymeric material or a glass fiber material. The pleats include roots, crowns, legs extending between the roots and crowns, an inner periphery at the roots defining an upstream side, and an outer periphery at the crowns defining a downstream side. Each pleat has a height h greater than $(D-d)/2$ where D is the outer diameter at the outer periphery of the plurality of pleats and d is the inner diameter at the inner periphery of the plurality of pleats.

One of the first and second end caps comprises a seal having an outside diameter greater than the largest outside diameter of the hollow separation arrangement. The end caps also include a polymeric or elastomeric material.

Providing a separation element including open joiner caps coaxially connecting two or more pack sections into a hollow separation arrangement being at least about 40 inches in length and having an interior diameter of at least about 2 inches is highly advantageous in many purification applications. Longer, larger diameter filter elements offer the advantage of increased filter medium surface area available for filtration, as well as a reduction in waste and expenses for materials and labor because of decreased change out frequency. Increasing the separation element length in combination with increasing the inside diameter provides a

separation element having increased surface area available for filtration without producing an unacceptably high core pressure differential.

Issues

The issues on appeal are:

Whether the invention defined by appealed claims 1 and 14-18, would have been obvious under 35 U.S.C. §103(a) to one of ordinary skill in the art in view of U.S. Patent No. 3,344,923 to Pall et al. (hereinafter referred to as "Pall '923") in view of U.S. Patent No. 5,543,047 to Stoyell et al. (hereinafter referred to as "Stoyell"), U.S. Patent No. 4,228,012 to Pall (hereinafter referred to as "Pall '012") and U.S. Patent No. 4,517,085 to Driscoll et al. (hereinafter referred to as "Driscoll").

Whether the invention as defined by appealed claim 19 would have been obvious under 35 U.S.C. §103(a) to one of ordinary skill in the art in view of U.S. Patent No. 3,344,923 to Pall et al. (hereinafter referred to as "Pall '923") in view of U.S. Patent No. 5,543,047 to Stoyell et al. (hereinafter referred to as "Stoyell"), U.S. Patent No. 4,228,012 to Pall (hereinafter referred to as "Pall '012") and U.S. Patent No. 4,517,085 to Driscoll et al. (hereinafter referred to as "Driscoll") and further in view of U.S. Patent No. 4,033,881 to Pall (hereinafter referred to as "Pall '881").

Grouping of Claims

For the purposes of this appeal, there is one group of claims to be considered. Claim 1 is an independent claim and claims 14-19 incorporate all of the limitations of claim 1. All of the claims stand or fall with independent claim 1.

Argument

Independent claim 1 and dependent claims 14-19 were rejected under 35 U.S.C. §103(a) as unpatentable over Pall '923, the primary reference, in view of a variety of secondary references. Since the primary reference teaches directly away from the invention defined in the claims, and since the references, even in combination, fail to disclose all the limitations in the claims, the rejection is improper.

The claims are directed to a separation element including two or more pack sections and adjacent open joiner caps secured to coaxially connect the pack sections and open joiner

caps into a hollow separation arrangement, e.g., an arrangement that allows fluid to flow through the connected pack sections.

Pall '923, in contrast, is directed to filter units having a reserve filter element in series with a primary filter element, the reserve filter element not coming into use until the primary filter element in the line of normal fluid flow becomes plugged (col. 1, lines 24-28). The filter units of Pall '923 consist of two annular filters in end-to-end relation separated by an annular adapter (Abstract). The annular adapter maintains the second filter element in reserve and entirely separated from the primary element, in such a manner that normal flow bypasses the second reserve element. When the primary filter element of Pall '923 becomes clogged, the annular adapter opens to bypass the primary filter element and direct fluid to the reserve element.

The primary, fundamental, and often repeated central teaching of Pall '923 is that a reserve filter, which does not come into use until a primary filter element becomes plugged, is provided. For example, Pall '923 states,

[T]his invention relates to filter units having a reserve filter element in series with the primary filter element which does not come into use until the primary filter element in the line of normal flow becomes plugged . . . (col. 1, lines 24-27);

[I]n accordance with the instant invention, this problem is resolved by providing a filter unit which includes two filter elements, the second of which is in series with respect to the first and remains in reserve, quite unused, until the first element becomes plugged. (col. 1, lines 51-55);

The reserve filter element is entirely separated from the primary element, in such a manner that normal flow by-passes the second reserve element. (col. 2, lines 2-5);

The lower filter element 16 is the reserve filter element, and is kept in reserve, quite unused, until the primary element 15 has become plugged, . . . (col. 2, lines 62-64).

Clearly, the filter element of Pall '923 is intended to direct fluid through a single filter element and to provide an adjacent unused filter element as a

replacement. Thus, Pall '923 is completely different from the present invention and indeed teaches directly away from securing adjacent open joiner caps to coaxially connect the pack sections and open joiner caps into a hollow separation arrangement that allows fluid to flow through all of the pack sections connected by the open joiner caps.

Furthermore even assuming *arguendo*, one of ordinary skill in the art would be led from the disclosure of Pall '923 to any of the remaining secondary references, these references fail to remedy the deficiencies of Pall '923. None of the secondary references disclose securing adjacent open joiner caps to coaxially connect the pack sections and open joiner caps into a hollow separation arrangement. Accordingly, since the cited references fail to disclose a limitation included in all of the claims, *prima facie* obviousness has not been established.

Additionally, none of the references, even in combination, disclose or suggest a hollow separation arrangement being at least 40 inches in length and having an interior diameter of at least 2 inches. According to the Office Action dated June 26, 2003, it is considered obvious to one of ordinary skill in the art to modify the length of the separation element in such a way that the element has a length of at least 40 inches and an interior diameter of at least about 2 inches, as a matter of choice by the user. However, modifying both the length and the interior diameter is not a choice presented by any of the cited references. None of the cited references suggest the desirability of the combination of a length of at least about 40 inches and an interior diameter of at least about 2 inches.

The Office Action asserts Pall '012 teaches that a separation element could be formed by linking up to any desired number (i.e., up to any length which could be at least about 40 inches or more or less) of modular smaller units in order to extend the filter capacity of the separation element. However, as set forth in the present specification (e.g., at page 46, lines 2-6), increasing the length without increasing the diameter may result in an undesirably high filter support core pressure differential (i.e., the pressure drop due to the length of the filter flow path axially through the interior of the filter element). Neither Pall '012, nor any of the other cited references, provides any suggestion of the desirability of increasing the interior diameter in combination with increasing the length.

Further, the Office Action on page 5 states with respect to an interior diameter of at least 2 inches,

... the interior diameter help[s] determine the extent or amount of fluid which can be filtered and allowed to pass through the filter separation element, and if there are more layers or the thickness of each porous medium forming the separation element is greater, this allows greater fluid filtration capacity at the same time slowing down the filtration rate, thereby allowing only a certain amount of filtered fluid through the filter media, and without changing the dimensions of the housing into which the separation element would be placed into, the only variable would be changed to accommodate a thicker or more layers of filter media would be the interior diameter of the separation element.

Although it is not entirely clear, it appears the Office Action is suggesting that if more layers were added to the element or the thickness of the porous medium was increased (i.e., making the outer diameter of the element larger), without changing the dimensions of the housing, the interior diameter of the separation element would have to be changed. However under this reasoning, the interior diameter must be decreased. In fact, this reasoning actually serves to highlight the patentability of the claimed invention. As the present specification makes clear (e.g., at page 46, lines 2-18), it is increasing the length in combination with increasing the interior diameter (i.e., to produce a hollow separation arrangement having a length of at least about 40 inches and an interior diameter of at least about 2 inches) that effectively allows much higher throughputs than prior art devices not having the claimed combination of length and interior diameter dimensions.

Conclusion

For the reasons set forth above, the Office Action has reached a conclusion not reasonably suggested by the references. Rather than finding a suggestion in the prior art, the Office Action has improperly used Appellants' disclosure as a template to select a few isolated elements from the cited references and to fill in the remaining gaps with "choices" nowhere suggested by the references. Such hindsight reconstruction is impermissible.

In re Appln. of CONNORS et al.
Application No. 09/091,508

Accordingly, Appellants respectfully submit that the rejections of the pending claims are improper and should be reversed.

Respectfully submitted,

Shannon Schemel

Shannon Schemel, Reg. No. 47,926
LEYDIG, VOIT & MAYER
700 Thirteenth Street, N.W., Suite 300
Washington, DC 20005-3960
(202) 737-6770 (telephone)
(202) 737-6776 (facsimile)

Date: July 18, 2003
SDS

APPENDIX

1. A separation element for separating one or more components from a fluid flowing through the separation element, the separation element comprising:

(a) two or more hollow pleated pack sections, each pack section having a plurality of pleats, wherein the plurality of pleats includes roots, crowns, legs extending between the roots and the crowns, an inner periphery at the roots defining an upstream side, and an outer periphery at the crowns defining a downstream side and wherein each pleat has a height h greater than $(D-d)/2$ where D is the outer diameter at the outer periphery of the plurality of pleats and d is the inner diameter at the inner periphery of the plurality of pleats, a retainer disposed around the pleats, first and second ends, and a porous medium comprising a polymeric material or a glass fiber material;

(b) open joiner caps attached to at least one end of each of the two or more pack sections, adjacent open joiner caps being secured to coaxially connect the pack sections and open joiner caps into a hollow separation arrangement being at least about 40 inches in length and having an interior diameter of at least of about 2 inches; and

(c) first and second end caps attached to the hollow separation arrangement, wherein one of the first and second end caps comprises a seal having an outside diameter greater than the largest outside diameter of the hollow separation arrangement, the end caps including a polymeric or elastomeric material.

14. The separation element of claim 1 wherein each pack section includes a core disposed along the inner periphery of the pleats.

15. The separation element of claim 1 wherein each pack section is free of a core.

16. The separation element of claim 1 wherein the end cap having the seal comprises an open end cap including a substantially cylindrical configuration having an outer periphery and a channel circumferentially arranged in the outer periphery, the seal being positioned in the channel.

17. The separation element of claim 16 wherein each pack section is free of a core.

In re Appln. of CONNORS et al.
Application No. 09/091,508

18. The separation element of claim 1 wherein the legs of the pleats are in intimate contact along substantially the entire height of the pleats.

19. The separation element of claim 1 wherein adjacent joiner caps are welded together.